Objectives

• Categorize a sample of matter as a substance or a mixture
• Distinguish between homogeneous and heterogeneous samples of matter

Key Terms

• mixture
• heterogeneous mixture
• homogeneous mixture
• solutions
• phase
• distillation

Part A Completion

Use this completion exercise to check your understanding of the concepts and terms that are introduced in this section. Each blank can be completed with a term, short phrase, or number.

1. A physical combination of two or more substances is a mixture.
2. A mixture has a variable composition and may be identified as heterogeneous or homogeneous. Homogeneous mixtures are known as homogeneous mixtures and have uniform properties. Any part of a system with uniform composition and properties is called a phase.
3. Many mixtures can be separated into their components by physical methods. Distillation is a method of separation involving boiling and re-condensation of a liquid.

Part B True-False

Classify each of these statements as always true, AT; sometimes true, ST; or never true, NT.

8. Homogeneous mixtures can be separated by distillation. ______ 8. AT
9. A solution has a uniform composition. ______ 9. AT
10. A heterogeneous mixture contains two or more phases. ______ 10. AT
11. A phase contains a single substance. ______ 11. AT
Part C  Matching

Match each description in Column B to the correct term in Column A.

<table>
<thead>
<tr>
<th>Column A</th>
<th>Column B</th>
</tr>
</thead>
<tbody>
<tr>
<td>12. mixture</td>
<td>a. a mixture that has a completely uniform composition</td>
</tr>
<tr>
<td>13. heterogeneous</td>
<td>b. any part of a system that has uniform composition and properties</td>
</tr>
<tr>
<td>14. homogeneous</td>
<td>c. a mixture which is not uniform in composition</td>
</tr>
<tr>
<td>15. solution</td>
<td>d. separation of a liquid solution by boiling and re-condensation</td>
</tr>
<tr>
<td>16. phase</td>
<td>e. a special name for a homogeneous mixture</td>
</tr>
<tr>
<td>17. distillation</td>
<td>f. a physical blend of two or more substances</td>
</tr>
</tbody>
</table>

Part D  Questions and Problems

Answer each of the following questions in the space provided.

18. State whether each of the following is a homogeneous or heterogeneous mixture.
   
   a. oxygen dissolved in water
   b. carbon mixed with sand
   c. filtered apple juice
   d. vegetable soup
   e. fresh squeezed lemonade

   a. ____________________________
   b. ____________________________
   c. ____________________________
   d. ____________________________
   e. ____________________________

19. Classify each of the following as a substance or a mixture.

   a. sugar (sucrose)
   b. hot tea
   c. salt (sodium chloride)
   d. vinegar

   a. ____________________________
   b. ____________________________
   c. ____________________________
   d. ____________________________